

THE WOLF SPIDERS OF AUSTRALIA (ARANEAE: LYCOSIDAE): 1.
THE BICOLOR GROUP

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ABSTRACT

A brief introduction to a systematic revision of the Australian lycosid spiders is given with a list of described species. Two new species *Lycosa forresti* and *Lycosa storri* are described with a review of the morphologically similar species *Lycosa bicolor*, *Lycosa errans*, *Lycosa castanea* and *Lycosa skeeti*. *Lycosa perinflata* is possibly a synonym of *Lycosa errans*.

The family Lycosidae, commonly known as Wolf Spiders, is almost cosmopolitan in its distribution. Within Australia this family is abundant in both species and numbers. At present some 113 species have been described. Rainbow (1911, pp. 264-76) provides references to 84 of these species; the remainder being described by Strand (1913), Rainbow (1915, 1917, 1920), Pulleine (1922), and Hickman (1944).

The writer commenced a systematic revision of the Australian species of the family Lycosidae in 1968. Shortly after, a large collection of Wolf Spiders was presented to the Western Australian Museum by Dr Barbara Y. Main, Zoology Department, University of Western Australia. This collection, in addition to Dr Main's notes on the type specimens held by the British Museum (Natural History), has proved of immense value to this investigation.

A number of personal surveys have been made throughout mainland Australia to gain information on the distribution, habitat selection, burrow construction, and life history of Wolf Spiders. The collections of other Australian museums and the type specimens from European museums are being examined.

MATERIALS AND METHODS

In this paper an effort has been made to reduce the technical terminology employed in the descriptions. Where this has been unavoidable the works of Comstock (1940), Main (1964), Hickman (1967), and Forster (1967) are useful references.

FIELD METHODS

COLLECTION. Wolf Spiders are largely nocturnal and although difficult to catch during the day, were readily collected at night with the aid of a head-torch.

BURROWS. These were exposed by digging a deeper hole adjacent to the burrow and the dimensions of the burrow recorded.

HABITAT. Topographical notes including degree of exposure, drainage, soil type, amount and composition of the litter, and notes on the surrounding vegetation were taken at the site of capture.

LIFE HISTORY. Information on the biology of each species was recorded whenever possible. This included records of seasonality, number and size of eggs laid, number of young released, food and feeding behaviour, and other natural history notes.

TAXONOMIC METHODS

MEASUREMENTS. All measurements were made on alcohol preserved material using a dial face 'Helios' caliper graduated in tenths of a millimetre, or by using a stereo dissecting microscope fitted with an ocular micrometer scale graduated in 100 units. The length of the carapace was taken along the midline, and leg segments were measured from articulation to articulation dorsally.

EYES. The eyes, disposed in three rows of 4, 2, 2, were referred to as anterior median eyes (AM), anterior lateral eyes (AL), posterior median eyes (PM) and posterior lateral eyes (PL). The ocular quadrangle included the eyes; the length and width was expressed in micrometer units. The ratio of the eyes was recorded as the maximum width of the separate eyes in micrometer units. A line tangential to the posterior margins of the anterior row of eyes (AM and AL) was curved anteriorly (procurved), straight, or curved posteriorly (recurved).

ILLUSTRATIONS. Drawings were from life, prepared from colour slides, or made with the assistance of a camera lucida or squared eyepiece graticule. The external surface of the epigynum was rubbed clear of hair and drawn in a dry condition. The internal genitalia were drawn from the dissected epigyna cleared in clove oil. In describing the genitalia the terminology of Bhatnagar and Sadana (1963) was followed. As the form of the epigynum of many species shows individual and geographic variation, a number of epigyna showing the internal genitalia as well as the external surface were illustrated for some of the species described. Published descriptions were not given in full; the serious student should consult the original descriptions if in doubt.

COLORATION. The colour descriptions were based on living specimens or on dried study material prepared by placing alcohol preserved specimens in 98% alcohol, 100% alcohol and xylene as described by Wallace (1942).

MATERIAL EXAMINED AND ABBREVIATIONS

Place names were those listed in the 'Gazetteer No. 40—Australia'. The following abbreviations were employed.

Collectors:

Mr A. Baynes	AB	Mr R. B. Humphries	RH
Mr W. H. Butler	HB	Dr Barbara Y. Main	BYM
Mr J. M. Gilbert	JG	Mr R. J. McKay	RJM

Institutions:

Australian Museum, New South Wales	AM
National Museum, Victoria	NM
Queensland Museum	QM
South Australian Museum	SAM
Western Australian Museum	WAM

Specimens:

mature specimens	M	juvenile specimens	J
penultimate instars	P	carapace length	C.L.

Family LYCOSIDAE

Ground dwelling spiders of small to quite large size. The eyes are characteristically arranged in three rows; the first row of four small eyes is located on the lower part of the face, frequently with the median pair larger than the laterals; the second row of two large eyes directed anteriorly; the third pair wider apart and located dorsally. The chelicerae have a robust basal segment (the paturon), with conspicuous lateral condyles, and a slender apical fang which lies at rest in a groove or cheliceral furrow, the margins of which bear teeth; the anterior or promarginal chelicerae teeth are usually three in number, with the median one largest; the posterior or retromarginal teeth vary from two to four, and are generally equal in size. The lorum of the pedicel of the abdomen is comprised of two pieces of which the posterior one is notched or recessed to receive the angular anterior one. The legs are long and frequently quite stout, the fourth pair longest. The distal margin of the trochanter has a notch on the ventral side. The females carry the egg cocoon attached to the spinnerets until the young hatch; the spiderlings, after hatching, clamber on to the abdomen and the posterior part of the carapace where they are carried by the female until the young disperse. For further information on the family the revision of the North American Lycosidae by Chamberlin (1908) can be consulted.

GENERA

A number of genera have been proposed in order to subdivide the large number of species included within the subfamily Lycosinae. Many genera are based on the relative size and spacing of the eyes, and the number of retromarginal cheliceral teeth. These characters have been found to be subject to some individual variation within some of the species examined by me. In compiling the following list of Australian lycosids I have

largely followed Guy (1966) in placing the species within accepted genera. I intend to review the Australian Wolf Spiders using Guy's generic boundaries until the Australian species are more adequately known, and then attempt a more natural classification. The first paper of this series describes a group of species I have termed the 'bicolor' group due to their similarity in coloration, form of the epigynum, and internal genitalia. A later regrouping of these species may result in their placement within the genus *Geolycosa* as a number of undescribed species with similar genitalia fall into the genera *Agalenocosa* and *Geolycosa*.

AUSTRALIAN SPECIES OF THE FAMILY LYCOSIDAE

CYCLOCTENINAE

<i>Cycloctenus</i> L. Koch, 1878	
<i>C. abyssinus</i> Urquhart, 1889	NSW
<i>C. flaviceps</i> L. Koch, 1878	Aust.
<i>C. vittatus</i> Rainbow, 1920	Lord Howe I.

HIPPASINAE

<i>Anomalomma</i> Simon, 1890	
<i>A. cinctipes</i> Simon, 1898	Qd
<i>Anomalosa</i> Roewer, 1960	
<i>A. kochi</i> (Simon, 1898)	Qd
<i>Venonia</i> Thorell, 1894	
<i>V. micarioides</i> (L. Koch, 1877)	Qd

PARDOSINAE

<i>Pardosa</i> C. L. Koch, 1848	
<i>P. eyrei</i> Hickman, 1944	SA
<i>P. pexa</i> Hickman, 1944	SA
<i>P. praevelox</i> Simon, 1909	WA
<i>P. versicolor</i> L. Koch, 1877	NSW
<i>Trabaea</i> Simon, 1876	
<i>T. lineata</i> L. Koch, 1877	NSW
<i>Trabaeola</i> Roewer, 1960	
<i>T. australiensis</i> (L. Koch, 1877)	NSW

LYCOSINAE

<i>Lycosa</i> Latreille, 1804	
<i>L. abmingani</i> Hickman, 1944	SA
<i>L. albopilata</i> Urquhart, 1893	Tas.
<i>L. aurea</i> Hogg, 1896	NT
<i>L. australicola</i> (Strand, 1913)	NT
<i>L. bicolor</i> Hogg, 1905	NT
<i>L. burti</i> Hickman, 1944	SA

<i>L. castanea</i> Hogg, 1905	SA
<i>L. celaenica</i> Rainbow, 1917	SA
<i>L. clara</i> L. Koch, 1877	Qd, NSW, Vic., SA
<i>L. cowlei</i> Hogg, 1896	NT
<i>L. dimota</i> Simon, 1909	WA
<i>L. errans</i> Hogg, 1905	SA
<i>L. excusor</i> L. Koch, 1867	Qd
<i>L. finkei</i> Hickman, 1944	SA
<i>L. flavisternis</i> L. Koch, 1877	Qd, NSW
<i>L. furcillata</i> L. Koch, 1867	Qd, NSW
<i>L. gilberta</i> Hogg, 1905	NSW
<i>L. gloriosa</i> Rainbow, 1920	Lord Howe I.
<i>L. habilis</i> (Hogg, 1905)	NSW
<i>L. halei</i> Hickman, 1944	NT
<i>L. hasseltii</i> L. Koch, 1877	Qd, SA
<i>L. hilaris</i> L. Koch, 1877	Tas.
<i>L. hostilis</i> L. Koch, 1877	Qd
<i>L. immansueta</i> Simon, 1909	WA
<i>L. impedita</i> Simon, 1909	WA
<i>L. inornata</i> L. Koch, 1877	Vic.
<i>L. lacertosa</i> L. Koch, 1877	SA
<i>L. laeta</i> L. Koch, 1877	Qd
<i>L. laeta curticeps</i> (Strand, 1913)	NT
<i>L. laeta protruda</i> (Strand, 1913)	NT
<i>L. marcentior</i> Simon, 1909	WA
<i>L. molyneuxi</i> Hogg, 1905	NSW
<i>L. naeviella</i> (Roewer, 1951)	NSW
<i>L. neptunus</i> (Rainbow, 1896)	NSW
<i>L. nigropunctata</i> Rainbow, 1915	SA
<i>L. obscuroides</i> (Strand, 1906)	Qd, NSW, SA, NT
<i>L. ornatula</i> L. Koch, 1877	Qd, NSW, Vic.
<i>L. palabunda</i> L. Koch, 1877	Qd, NSW
<i>L. percauta</i> Simon, 1909	WA
<i>L. perinflata</i> Pulleine, 1922	SA
<i>L. propitia</i> Simon, 1909	WA
<i>L. pruinosa</i> L. Koch, 1877	NSW
<i>L. pullastra</i> Simon, 1909	WA
<i>L. segregis</i> Simon, 1909	WA
<i>L. senilis</i> L. Koch, 1877	Qd, NSW
<i>L. sibyllina</i> Simon, 1909	WA
<i>L. simsoni</i> Simon, 1898	Tas.
<i>L. skeeti</i> Pulleine, 1922	SA
<i>L. speciosa</i> L. Koch, 1877	NSW
<i>L. spinipes</i> (Rainbow, 1896)	NSW

<i>L. subligata</i> (L. Koch, 1877)	Qd
<i>L. tasmanica</i> Hogg, 1905	Tas.
<i>L. tasmanicola</i> Roewer, 1960	Tas.
<i>L. topaziopsis</i> Hogg, 1896	SA
<i>L. tula</i> (Strand, 1913)	NT
<i>L. waitei</i> Rainbow, 1917	SA
<i>L. woodwardi</i> Simon, 1909	WA
<i>L. zualella</i> (Strand, 1907)	NSW
<i>Agalenocosa</i> Mello-Leitao, 1944	
<i>A. fallax</i> (L. Koch, 1877)	Qd
<i>A. leucophaeoides</i> (Roewer, 1951)	Qd, NT, Vic.
<i>Alopecosa</i> Simon, 1885	
<i>A. funesta</i> (C. L. Koch, 1837)	Tas.
<i>A. leonhardi</i> (Strand, 1913)	SA
<i>A. madigani</i> (Hickman, 1944)	NT
<i>Arctosa</i> C. L. Koch, 1848	
<i>A. goyderi</i> (Hickman, 1944)	SA
<i>Arkalosula</i> Roewer, 1954	
<i>A. semicineta</i> (L. Koch, 1877)	Qd
<i>Artoria</i> Thorell, 1877	
<i>A. cingulipes</i> Simon, 1909	WA
<i>A. flavimanus</i> Simon, 1909	WA
<i>A. taeniifera</i> Simon, 1909	WA
<i>Cynosa</i> Caporiacco, 1933	
<i>C. ramosa</i> (L. Koch, 1877)	NSW, Vic.
<i>Diapontia</i> Keyserling, 1876	
<i>D. alboguttulata</i> (L. Koch, 1878)	Qd, NSW, Vic.
<i>Geolycosa</i> Montgomery, 1904	
<i>G. festina</i> (L. Koch, 1877)	Qd
<i>G. godeffroyi</i> (L. Koch, 1865)	NSW, Qd, Vic.
<i>G. pictiventris</i> (L. Koch, 1877)	NSW, Qd.
<i>G. serrata</i> (L. Koch, 1877)	NSW
<i>Hygrolycosa</i> Dahl, 1908	
<i>H. crispipes</i> (L. Koch, 1877)	Qd, NSW, NT
<i>Lycorma</i> Simon, 1885	
<i>L. albosparsa</i> (L. Koch, 1876)	Qd, NT
<i>L. bellatrix</i> (L. Koch, 1865)	Aust.
<i>L. subrufa</i> (Karsch, 1878)	Tas.
<i>L. meracula</i> (Simon, 1909)	WA
<i>Ocyale</i> Savigny and Audouin, 1825	
<i>O. oraria</i> (L. Koch, 1876)	WA
<i>Orinocosa</i> Chamberlin, 1916	
<i>O. stirlingae</i> (Hogg, 1905)	NSW

<i>Pirata</i> Sundevall, 1833	
<i>P. brisbanæ</i> (L. Koch, 1878)	Qd
<i>Schizocosa</i> Chamberlin, 1904	
<i>S. berenice</i> (L. Koch, 1877)	NSW, Vic.
<i>S. christopheri</i> (Simon, 1909)	WA
<i>S. egena</i> (L. Koch, 1877)	Qd
<i>S. expolita</i> (L. Koch, 1877)	Qd
<i>S. infensa</i> (L. Koch, 1877)	NSW, Qd
<i>S. leuckartii</i> (Thorell, 1870)	Qd, WA
<i>Tricca</i> Simon, 1898	
<i>T. phegeia</i> Simon, 1909	WA
<i>Trochosa</i> C. L. Koch, 1848	
<i>T. candicans</i> (L. Koch, 1877)	NSW, SA
<i>T. exculta</i> (L. Koch, 1876)	NSW
<i>T. martensii</i> (Karsch, 1878)	Aust.
<i>T. properipes</i> (Simon, 1909)	WA
<i>T. tristicula</i> (L. Koch, 1877)	NSW
<i>Varacosa</i> Chamberlin and Ivie, 1942	
<i>V. arenaris</i> (Hogg, 1905)	NT
<i>V. hickmani</i> Roewer, 1954	
(= <i>L. fletcheri</i> Hickman, 1944 preocc. Gravely, 1924)	NT
<i>V. phyllis</i> (Hogg, 1905)	NSW, SA
<i>V. pulveresparsa</i> (L. Koch, 1877)	Qd, NT
<i>Venator</i> Hogg, 1900	
<i>V. marginatus</i> Hogg, 1900	Vic.
<i>V. spenceri</i> Hogg, 1900	Vic.
<i>Venatrix</i> Roewer, 1954	
<i>V. fuscus</i> (Hogg, 1900)	Vic.

The following species described by F. Karsch in 1880 from the Hawaiian Islands are not Australian as listed by Roewer (1954).

<i>Lycosa aliusmodi</i>	<i>L. caduca</i>
<i>L. bruta</i>	<i>L. calvata</i>
<i>L. bruta filicum</i>	<i>L. virgata</i>

***Lycosa bicolor* Hogg, 1905**

(Figs. 1a-e, 2a-c)

Lycosa bicolor Hogg, 1905, pp. 580-2, fig. 85, no locality given; Rainbow, 1911, p. 266, Australia; Strand, 1913, p. 618, central Australia; Bonnet, 1957, p. 2636.

Allocosa bicolor: Roewer, 1954, p. 205.

MATERIAL EXAMINED

SYNTYPES: 3, SAM, labelled 'S.A. Mus. Coll. No locality—*Lycosa bicolor* Nov. Sp. H. R. H. Type' in pencil, '*Lycosa bicolor* Hogg. No locality. S.A. Museum coll.' in indian ink on separate labels, a small label in pencil, 'F. 194,' and 'Type' printed but badly faded. A lectotype is here designated from this series.

LECTOTYPE: ♀, C. L. 11.2 mm, epigynum fully developed, in good condition, separated from the syntype series with original labels. Appears to be the female illustrated by Hogg (1905, fig. 85b).

PARALECTOTYPES: ♀, C. L. 10.2 mm, epigynum small but completely formed, one leg and part of another leg missing. One ♂ P, C. L. 8.8 mm, abdomen and right legs detached.

OTHER MATERIAL: Western Australia: Burnabinmah Station, 25.v.1968, JG, WAM 69-92, WAM 71-880-1; Comet Vale, 20.v.1956, BYM, WAM 68-510; Cosmo Newbery 53 miles south, 21.v.1969, Christchurch School, WAM 69-841-2; Dales Gorge, Fortesque River, 29.ix.1969, RJM, A. Burbidge, WAM 69-1048; Great Northern Highway 482 mile peg, 24.v.1969, JG, WAM 69-878; Great Northern Highway 256 mile peg, 20.iv.1968, JG, WAM 69-891; Hammersley Gorge, Fortesque River, 29.ix.1969, RJM, WAM 69-1045; Jigalong, 1965, R. Kirkby, WAM 71-1438; Kangiangi, 26.i.1958, WAM 71-1436; Marvel Loch 28 miles southeast, 27-28, iii, 1969, J. Bannister, K. Youngson, WAM 69-668; Meekatharra 3 miles south, 1.x.1969, A. Burbidge, T. Evans, WAM 69-1049; Mount Bruce 18 miles west, 29.ix.1969, RJM, WAM 69-1046; Mount Bruce 13 miles east, 29.ix.1969, RJM, WAM 69-1047; Mount Gibson 2 miles east of turnoff, 7.xii.1968, RJM, JG WAM 68-792; Mount Gibson, 23.ii.1962, BYM, WAM 71-879; Mount Magnet 323 mile peg, 8.xii.1968, RJM, JG, WAM 68-822, WAM 69-843, WAM 69-877; Paynes Find 5 miles east, 28.ii.1970, RJM, WAM 70-55; Paynes Find 5 miles west, 10.iv.1955, BYM, WAM 68-506; Robe River area, 18.v.1971, Sampey Exploration Services, WAM 71-1439; Warburton Range, 1967-68, J. E. Carr, WAM 68-507-9, WAM 68-511, WAM 68-512, WAM 71-882-7; Warburton Mission, 3.ix.1963, M. de Graaf, WAM 69-836; Wubin, WAM 33-1613; Yandi, WAM 38-915.

Northern Territory: Ayres Rock, H. T. Phillips, WAM 68-513; Charlotte Waters, 1901-02, Spencer Gillen Expedition, NM; Ligertwood Cliffs 3 miles west, 21.v.1971, J. Dell, WAM 71-1437; Palm Creek, NM.

South Australia: Coober Pedy 10 miles east, 30.viii.1970, HB, W. D. L. Ride, WAM 70-214-6; Jay Creek, vi.1938, C. Barrett, SAM; Tallaringa Well 17 miles west, 13.iii.1970, J. Dell, WAM 70-50.

DESCRIPTION

Based on WAM 69-843, ♀, C. L. 10.2 mm.

Carapace uniform buff without lateral or median stripes. Abdomen intensely black above and below, with an anterior buff stripe longer than wide, pointed posteriorly, and extending to the middle of the abdomen. Sternum and coxae black. Legs black from coxae to near the extremities of the patellae above, and including the patellae below. Tibiae, tarsi and metatarsi buff. Labium and maxillae brown. Palps buff, with femora brown. Chelicerae with the anterior surface buff, becoming red-brown near fangs. Eyes frequently become emerald green in colour after preservation in alcohol.

Anterior row of eyes procurved, AM larger than AL, PM more than twice the diameter of the AM and $\frac{2}{3}$ of their diameter apart. PL 3 diameters apart and about half that distance from the PM.

Chelicerae with three promarginal teeth, the middle one largest; three retromarginal teeth of equal size.

TABLE I
MEASUREMENTS OF LEG SEGMENTS OF *L. bicolor* IN MM*

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus
1	8.2	4.1	6.5	6.7	3.2
2	7.7	3.9	6.0	6.4	3.3
3	7.7	3.6	5.2	6.8	3.5
4	8.7	4.0	7.0	9.4	4.1
Palp	4.7	2.3	3.0	—	3.2

* WAM 69-1045, ♀M, C.L. 11.4 mm.

VARIATION: Juveniles are completely buff in colour with a slightly darker brown longitudinal lanceolate stripe on the anterior dorsal surface of the abdomen. The carapace is of a uniform buff colour with some examples having the area within the ocular quadrangle darker.

The transition to the adult coloration occurs at a C. L. of 6.4 to about 7.2 mm; the venter of the abdomen becomes black, and the anterior sides of the abdomen become dark brown to black; the femora are dark grey-brown to black and may be quite black in some small specimens; the undersurface of the femora usually becomes progressively darker until they are quite black. The black area of the venter extends up the lateral surface of the abdomen thus reducing the buff area of the dorsal surface until it almost disappears. Specimens from near Coober Pedy, S.A., have the carapace, the broad area on the dorsal surface of the abdomen, and the distal segments of the legs bright lemon-yellow. Adults show variation in the extent of the buff area on the dorsal surface of the abdomen, some examples are illustrated (Fig. 1 b-e).

The eye measurements were found to vary in the two specimens examined. ♀ P from Jay Creek, S.A., C.L. 9.3 mm, had the ratio of eyes AM:AL:PM:PL = 10:7:21:19; distance AM:AM 5, AM:AL 5, AM:PM 3.5, AL:PM 3, PM:PM 15. Clypeus to AM 7. Width of first eye row 46, width of second eye row 60. Ocular quadrangle 59 × 73. WAM 69-1045, ♀ M, C.L. 11.4 mm, had ratio of eyes AM:AL:PM:PL = 15:9:35:27; distance AM:AM 7, AM:AL 6, AM:PM 4, AL:PM 4, PM:PM 20. Clypeus to AM 10. Width of first eye row 63, width of second eye row 80. The ratio of eyes given by Hogg (1905, fig. 85a) is AM:AL:PM:PL = 5:3:13:8.

The internal genitalia of two females is illustrated (Fig. 2 b, c). The epigynum of the lectotype is illustrated in Figure 2a.

SIZE RANGE: Mature females C.L. 9.1 to 12.0 mm.

DIAGNOSIS: *Lycosa bicolor* differs from the other members of the 'bicolor group', *L. forresti*, *L. storri*, *L. errans*, *L. castanea*, and *L. skeeti* in having the femora and half the patellae black and in having the abdomen completely black with an anterior dorsal longitudinal buff stripe of variable size.

LIFE HISTORY

Mature females are to be collected throughout the year, but are most common from September to March in W.A. Mature males are very rare and the palpal organ has not been described. Penultimate males have been collected from September to May, and appear to be most abundant in September in the Pilbara region of W.A. In the laboratory, females carry the egg cocoon attached to the spinnerets whilst in the burrow; in the field they have not been found, and it is possible that they completely seal the burrow during the period they are carrying the cocoon. One female carrying young was found occupying an open burrow near Mt Magnet, W.A., December 8, 1968; and by February at Paynes Find, juveniles in an early stage of transition to the adult coloration were very numerous.

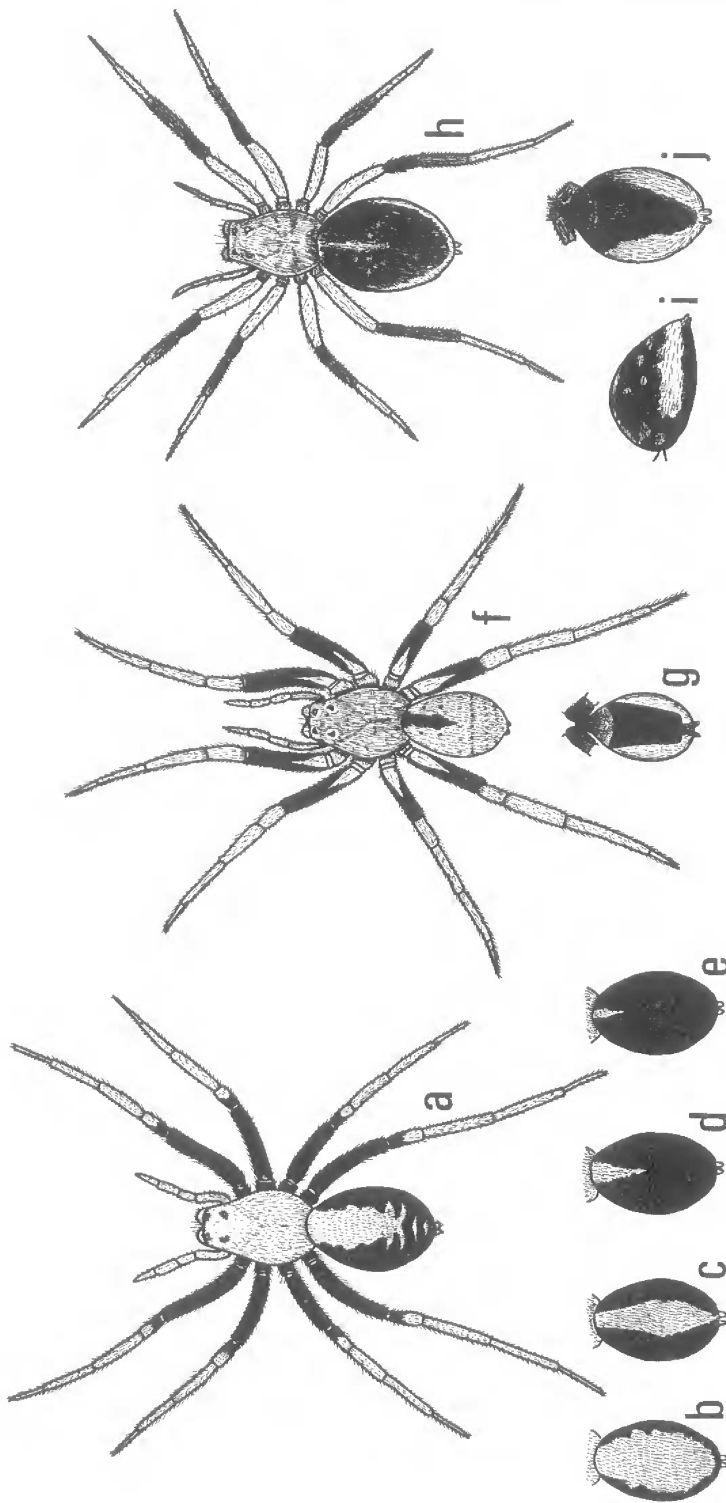


FIG. 1: a-e, *Lycosa bicolor*. a, mature female WAM 68-822, 323 mile peg, Mount Magnet, W.A.; b-e, dorsal surface of abdomen of WAM 69-1047, WAM 69-1046, 69-891, and WAM 68-507.
 f-g, *Lycosa forresti*. f, mature female WAM 69-456; g, ventral surface of abdomen.
 h-j, *Lycosa storri*. h, mature female WAM 68-828; i, lateral surface of abdomen; j, ventral surface of abdomen.

HABITAT

All specimens collected in Western Australia have been taken on 'arid red earth' or heavy 'desert loams'. The soil is frequently well compacted and may include red clay-loam, red-brown clay soil, and red earths associated with stone outcrops. A few specimens have been taken in the wind-swept heavy clay soils near desert sand-plain areas. Where road construction or clearing has disturbed the red clay-loams, *Lycosa bicolor* may take advantage of the more friable soil and construct burrows in the overturned areas. They have not been collected from sandy soils or from riverine alluvial soils. Vegetation is frequently Mulga *Acacia aneura*, *Eucalyptus* woodlands on red loams, and sometimes Mallee or *Triodia* on clay-loams. *Lycosa bicolor* is frequently taken in association with *Lycosa forresti* and *Lycosa storri*.

BURROW

The burrow is of an open vertical type without a trace of a mound or elevated rim. The burrow is usually constructed in open areas free from leaf litter or obstructing vegetation, and away from rocks, or *Triodia* tussocks. Burrows may descend to a depth of 23 cm in red loam soils or be as shallow as 10 cm in the more compact clay soils. The entrance is not sealed with a door or lid, but mature females may close the entrance with a thin web veil situated a few mm down the burrow. The diameter of the burrow depends on the size of the spider; a large female may have a burrow up to 16 mm in diameter. This species rarely leaves the burrow in search of prey, its characteristic position at night is just below the entrance, or half draped over the edge of the burrow. *Lycosa bicolor* retreats down the burrow when approached. The species is frequently aggressive when aroused, and may attack vigorously when first removed from the burrow.

In the laboratory, one large penultimate male was observed constructing a burrow in a glass aquarium three parts filled with red clay-loam. The excavated soil was loosely webbed into large pellets about the size of the abdomen, and carried to the far corner of the aquarium approximately 26 cm away, where it was piled against the glass. Some ten or more pellets were transported by the spider and dumped well away from the burrow; this enabled the burrow entrance to be maintained quite flush with the surface. Young females were observed to carry pellets of soil away from the burrow entrance, but mature females were reluctant to construct a burrow under laboratory conditions, and when they did so frequently deposited the soil nearby or in a mound surrounding the entrance.

DISTRIBUTION

South Australia, Northern Territory and Western Australia.

***Lycosa forresti* sp. nov.**

(Figs. 1f-g, 2d-g)

MATERIAL EXAMINED

HOLOTYPE: Western Australian Museum WAM 70-44, ♀ M, C. L. 12.4 mm, 8 miles west of Moorine Rock, W.A., collected by Mr W. H. Butler, 8 January, 1970. In spirit.

PARATYPES: Western Australia; Buntine 3 miles southeast, ix. 1972, AB, N. Allen, 1 ♀ M, WAM 72-635, 2 ♀ M1J, WAM 72-639-41; Carrabin, 3.ix.1962, BYM, 1 ♀, WAM 69-37; Coonana 12 miles northwest, 25.i.1956, BYM, 1 ♀, WAM 69-35; Hyden, 26.i.1968, L. E. Koch, 1 ♂, WAM 69-801; Kulin, 1 ♀, WAM 33-1607; Lake

Moore near south end, 24.xi.1970, AB, 1 ♂ P, WAM 71-198; Laverton, 1 ♀, WAM 26-717; Marloo Station, 31.i.1968, L. E. Koch, 1 ♀, WAM 69-42; Marvel Loch 10 miles east-southeast at Neuoria Mine, 9.i.1970, HB, 1 ♀ M, WAM 70-30; Morawa, 17.viii.1953, BYM, 1 ♀ M, WAM 70-172; Paynes Find to Mount Magnet 323 mile peg, 7-8.xii.1968, RJM, JG, P. Snowball, 1 ♀, WAM 69-46, 1 ♂, WAM 69-465, 1 ♀ M, WAM 69-467, 1 ♀ M, WAM 69-791, 1 ♀ M, WAM 70-186; Rudall River, 5.v.1971, RJM, R. W. George, 1 ♀ M, WAM 71-1151; Southern Cross, 14.x.72, J. Bownds, 1 ♀ M, WAM 72-634; Southern Cross 6 miles east, 4.vi.1957, BYM, 1 ♀ M, WAM 69-40; Tammin, 28.viii.1956, BYM, 1 ♀, WAM 69-38; Wongan Hills 106 mile peg, 6.xii.1968, RJM, JG, 1 ♂ P, WAM 69-792; Wongan Hills to Ballidu 135 mile peg, 7.xii.1968, RJM, JG, P. Snowball, 1 ♀ M, WAM 69-827, 1 ♀ P, WAM 69-828; Wubin, 3.v.1963, J. Rayner, 1 ♀ P, WAM 69-41; Wubin 20 miles northeast, 14.vii.1968, RJM, JG, 1 ♀ J, WAM 69-43; Wubin 10 miles northeast, 14.vii.1968, RJM, JG, J. Ayres, 1 ♀ M, WAM 69-456; Yandi, 1 ♀ M, WAM 38-916 dried; Yellowdine 38 miles south, 6.xi.1970, HB, 1 ♀ M, 5 ♀ P, 1 ♂ P, WAM 71-69-75; Yellowdine 18 miles south, 23.x.1970, HB, 1 ♀ P, WAM 71-76.

DESCRIPTION

Based on the holotype.

Carapace uniform buff, without lateral or median stripes; head region around ocular quadrangle darker, face buff; some barely discernable radial furrows are present on the carapace, but these are not present in life; paturon black with the anterior surface buff; lateral condyle red; fangs black; labium and maxillae black; sternum black. Abdomen buff above and on sides; a jet black longitudinal lanceolate stripe on the anterior dorsal surface reaches to about middle of abdomen; on each side of this black stripe are scattered fine black spots becoming arranged into vague transverse rows posteriorly; venter with a broad black field reaching to and surrounding anterior spinnerets; region before epigastric furrow black. Legs with coxae and trochanters black ventrally, dorsal surface buff; femora jet black with wedge-shaped buff stripes on the proximal dorsal surface reaching to the middle of the femur; patellae black below, buff above, tibiae, metatarsi and tarsi buff above, dark grey below; palpi buff above, dark grey to black below; spines black.

Anterior row of eyes procurved, AM larger than AL, PM more than twice the diameter of the AM, and 2/3 of their diameter apart. Ratio of eyes AM:AL:PM:PL = 16:11:35:32; distance AM:AM 7, AM:AL 8, AM:PM 7, AL:PM 8, PM:PM 21. Clypeus to AM 17. Length of first eye row 69; length of second eye row 89.

TABLE 2
MEASUREMENTS OF LEG SEGMENTS OF *L. forresti* IN MM

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus
1*	10.8	4.7	8.5	8.6	4.7
2*	10.0	4.5	7.5	8.3	5.0
3*	9.0	3.7	6.8	9.5	4.9
4*	11.0	4.5	9.0	12.5	5.3
Palp*	5.5	2.4	3.1	—	3.6
1†	11.1	4.1	8.8	9.0	4.6
2†	10.2	4.7	8.3	8.9	4.8
3†	9.2	4.6	7.2	9.7	5.3
4†	11.6	4.6	9.5	13.1	6.0
Palp†	5.5	2.7	3.2	—	4.0

* Holotype † WAM 71-69, ♀M, C.L. 12.8 mm

Chelicerae with three promarginal teeth, the middle one largest; three retromarginal teeth of equal size (ten specimens examined).

VARIATION: Juveniles are buff with a pale brown, longitudinal, stripe on the anterior of the abdomen; a dull smoky grey to blackish longitudinal field on the venter of the abdomen. Some adults have the venter of the abdomen completely black, and lack the distinct lanceolate stripe on the anterior dorsal surface of the abdomen. It is possible that this species fragments into a number of separate populations, as the WAM collection contains atypical specimens from Forrest, Rawlinna, and the Fitzgerald River.

Eye measurements were recorded for 11 specimens; each measurement is given in Table 3 as a percent of the total width of the first eye row. Some variation is to be found in the eye proportions.

TABLE 3
EYE DIAMETERS AND INTERSPACES OF *L. forresti*
CONVERTED TO PERCENT OF THE TOTAL WIDTH OF
THE FIRST ROW OF EYES

Regd No.	Sex	C.L.	AM	AL	PM	PL	AM:AM	AM:AL	PM:PM	AM:PM
Holotype	♀M	12.4	23	16	51	46	10	12	30	10
WAM 72-635	♀M	11.7	23	16	48	45	9	9	35	10
WAM 72-639	J	7.7	22	17	50	45	9	7	30	9
WAM 72-640	♀M	12.5	25	15	52	46	9	6	30	10
WAM 72-641	♀M	12.4	24	17	51	43	9	7	33	9
WAM 70-30	♀M	12.7	25	15	49	44	9	9	32	10
WAM 70-172	♀M	12.4	25	15	52	45	9	7	33	10
WAM 72-634	♀M	13.5	23	15	48	44	10	8	37	11
WAM 69-827	♀M	11.3	23	15	48	46	9	8	32	9
WAM 71-69	♀M	13.2	24	15	51	43	8	7	32	8
WAM 71-70	♀P	11.0	24	16	52	44	10	7	35	8
WAM 71-71	♀P	9.9	24	15	51	44	10	7	29	10

The measurements of the leg segments also indicate variation in relative proportion of the separate segments as shown in Table 2.

Variation in the internal genitalia is shown in Figure 2 e-g. All mature females have the epigynum as illustrated in Figure 2d, the holotype was not figured.

SIZE RANGE: Mature females C.L. 10.3 to 13.8 mm.

DIAGNOSIS: *Lycosa forresti* may be distinguished by the presence of buff wedge-shaped areas on the femora, the coloration of the dorsal surface of the abdomen, and the presence of a strong lid closing the entrance of the burrow.

LIFE HISTORY: Mature females may be collected throughout the year, but appear to be most abundant during the summer months. Mature males have not been collected.

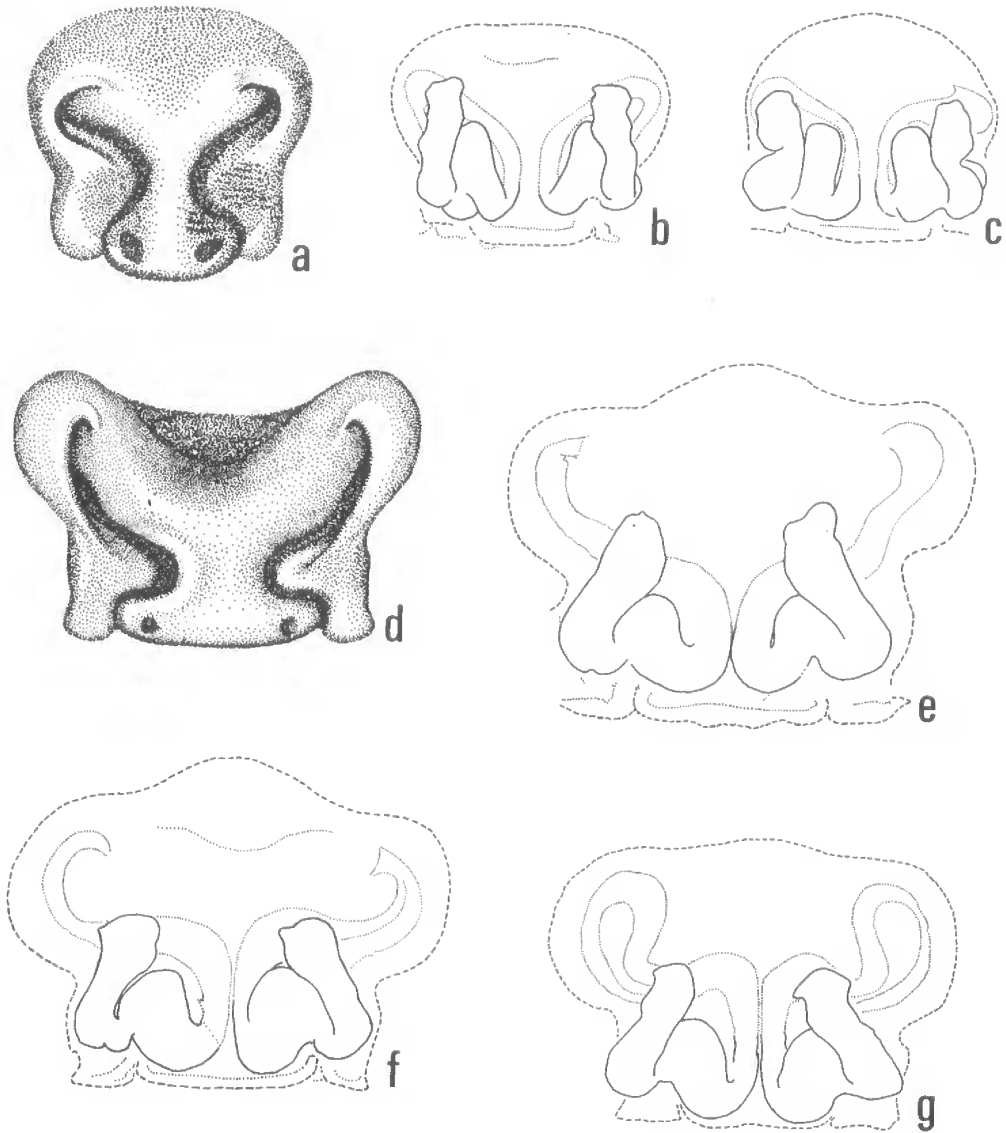


FIG. 2: a–c, *Lycosa bicolor*, female genitalia; a, epigynum of lectotype; b–c, internal genitalia of WAM 68-792, and WAM 69-1045.

d–g, *Lycosa forresti*, female genitalia; d, epigynum of WAM 69-35; e–g, internal genitalia of WAM 69-837, WAM 71-69, and WAM 69-827.

HABITAT

Red clay-loams with Mulga, Salmon Gum, and Spinifex. Some specimens have been collected from the margins of claypans by shaving the surface with a spade to expose the well concealed burrows.

BURROW

This species was thought to inhabit the heavy lidded burrows of mygalomorph spiders until burrows were constructed under laboratory conditions. The burrow extends to a depth of between 7 and 23 cm and has a maximum diameter of 17 mm. All burrows have a heavy silk-bound clay lid, tapered slightly to fit the entrance. When closed, the burrow is almost impossible to locate. On occasions the door may incorporate a piece of stone with a soil and silk cap. In the laboratory, females frequently seal the door shut with silk, and may remain within for a period exceeding one month; they can be induced to emerge by sprinkling water on the surface of the burrow area. The spider rarely leaves the burrow, and at night may be seen straddling the burrow with the hinged door thrown open. When disturbed, the spider rapidly retreats down the burrow pulling the door shut. If the door is gently prized open, the spider will attempt to pull the lid down from below by hooking the tarsal claws of the first pair of legs into the silk covering of the ventral surface of the door.

DISTRIBUTION

Arid and semi-arid regions of Western Australia.

DERIVATION

Named in honour of Sir John Forrest, Australian explorer, and first Premier of Western Australia.

***Lycosa storri* sp. nov.**

(Figs. 1h-j, 3a-e)

MATERIAL EXAMINED

HOLOTYPE: Western Australian Museum WAM 70-240, ♀ M, C. L. 9.6 mm, 38 miles south of Yellowdine, W.A., collected by Mr W. H. Butler, 6 November, 1970. Epigynum removed but retained in tube. In spirit.

PARATYPES: Western Australia: Albion Downs 24 miles southwest, no date, BYM, 1 ♂ P, WAM 71-875; Billeranga, 15.viii.1953, BYM, 1 ♀, WAM 68-501; Broad Arrow, 4-8.iv.1969, B. Evans, 1 ♀ P, WAM 70-22; Burnabinmah Station, 25.v.1968, JG, 1 ♂ J, WAM 68-823, 1 ♀ M, WAM 68-828; Clunker Hill, 31.viii.1954, BYM, 1, WAM 68-504; Corrigin, 4.xi.1961, BYM, 1 ♀ M, WAM 71-874; Dulbelling, 29.ii.1957, BYM, 1J, WAM 68-825; Hyden, 10.vi.1952, BYM, 1 ♀ P, WAM 71-456, 29.iii.1954, BYM, 1J, WAM 69-884; Karonie 4 miles northeast, 25.i.1956, BYM, 1 ♀ M, WAM 68-505; Kellerberrin, 1938, 1 ♀, WAM 38-1298; Koorda, vii.1939, 1 ♀, WAM 39-2169, ii.1970, E. Hawkins, 1 ♀ M, WAM 70-245; Lake Moore near south end, 23-24.xi.1970, AB, 1 ♀ M, WAM 71-174, 1 ♀ M 1 ♂ P, WAM 71-175-6, 1J, WAM 71-197; Leonora 15 miles east, 18.vi.1969, L. E. Koch, D. D. Guiliani, 1J, WAM 70-206; Marloo Homestead, 31.1.1968, L. E. Koch, 1 ♀ M, WAM 69-835; Merredin, BYM, 1 ♀, WAM 68-502, 5.xii.1953, BYM, 1 ♀ M, WAM 69-888; Moorine Rock, 28.viii.1954, BYM, 1 ♀, WAM 68-500; Mount Gibson, 28.ii.1962, BYM, 1J, WAM 71-876, 1 ♀ M, WAM 71-877; Mullewa 1½ miles east, 19.iii.1957, BYM, 1 ♀ J, WAM 68-829; Muralgarra, 1939, 1 ♂ M, WAM 39-2564, 1 ♀ M, WAM 39-2565, 1 ♀ M, WAM 39-2566, dried specimens; Narembeen, 8.vi.1952, BYM, 1 ♀ M, 6 ♀ P, 5 ♀ J, 10 ♂ P, 10 J, WAM 69-962-94; Noongaar, xi.1939, 1, WAM 39-2472; Nukarni, 1947, 1 ♀, WAM 47-963; Paynes Find

223 mile peg, 8.xii.1968, RJM, JG, 1 ♂, WAM 69-454; Paynes Find 5 miles east, 28.ii.1970, RJM, 2J, WAM 70-53-4, 4J, WAM 70-202-5; Quairading, 14.i.1954, BYM, 1, WAM 69-885; Randells 13 miles west on railway, 25.i.1956, BYM, 1 ♀ J, WAM 68-827; Walebing 3 miles north, 4.iv.1956, BYM, 1 ♀, WAM 68-498; Walyahmoning Rock 1 mile southwest, 31.v.1970, AB, 1, WAM 70-51; Warburton Range, 16.iii.1963, M. de Graaf, 1 ♀ M, WAM 71-878; Wialkie at Arnold's Water Reserve, 24.iv.1957, BYM, 1 ♀, WAM 68-826; Williams, 10.iv.1955, W. Sedgewick, 1 ♀, WAM 68-824; No locality, WAM 69-886, WAM 69-890, WAM 70-202.

DESCRIPTION

Based on the holotype.

Carapace buff, without lateral or median stripes; head region around ocular quadrangle almost black with buff hair, face dark; paturon black, fangs black; labium and maxillae dark brown; sternum dark brown; coxae and trochanters dark brown. Abdomen black with a thin continuous yellow-buff lateral band just before the spinnerets and continuing around the sides where it broadens until it reaches the middle of the abdomen; venter appears yellow from below with a black field from the epigastric furrow to the spinnerets, anterior to the epigastric furrow are pale yellowish areas; a faint narrow grey lanceolate stripe on the anterior dorsal surface reaching to about one third the length of the abdomen; spinnerets dark brown. Legs with femora bright yellow-buff with the dorsal surface pale brown; patellae and tibiae dark brown to black; metatarsi and tarsi yellowish-buff dorsally, darker below; spines black. Epigynum with the median arm of the guide broadest anteriorly (Fig. 3a).

TABLE 4
MEASUREMENTS OF LEG SEGMENTS OF *L. storri* IN MM.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus
1*	7.4	2.9	5.4	5.6	3.3
2*	6.7	2.8	5.3	6.0	3.5
3*	6.4	2.8	4.2	6.1	3.5
4*	7.7	3.0	6.0	8.8	4.0
Palp*	3.9	1.6	2.3	—	2.8
1†	9.0	4.0	6.7	7.5	3.9
2†	8.2	3.8	6.1	7.5	4.0
3†	7.7	3.7	5.6	7.6	4.0
4†	9.2	4.0	7.3	10.1	4.8
Palp†	4.8	2.2	2.8	—	3.7
1‡	6.5	3.0	4.6	4.9	3.2
2‡	6.0	2.9	4.5	5.0	3.2
3‡	5.6	2.6	3.8	5.0	3.0
4‡	6.8	2.9	5.3	6.9	3.4
1**	7.3	3.0	5.2	5.4	3.1
2**	6.8	3.0	4.6	5.5	3.3
3**	6.0	2.9	4.2	5.6	3.4
4**	7.4	3.2	5.7	7.7	4.0

* Holotype † WAM 71-874, ♀M, C.L. 11.3 mm ‡ WAM 38-1298, ♀M, C.L. 8.5 mm

** WAM 39-2169, ♀, C.L. 9.2 mm

Anterior row of eyes procurved, AM much larger than AL. PM about $2\frac{1}{2}$ times the AM and $\frac{2}{3}$ of their diameter apart. Ratio of eyes AM:AL:PM:PL = 12:9:30:27; distance AM:AM 6, AM:AL 5, AM:PM 5, AL:PM 5, PM:PM 19. Clypeus to AM 10.

Chelicerae with three promarginal teeth, the middle one largest; three retromarginal teeth of equal size (thirty specimens examined).

VARIATION: Juveniles are completely buff in colour with a much darker red-brown longitudinal lanceolate stripe on the anterior dorsal surface of the abdomen. The juveniles are therefore very like those of *Lycosa bicolor*, but may be distinguished by the pronounced dark red-brown longitudinal stripe which reaches beyond the mid-length of the abdomen and may break up into a number of connected transverse chevrons. The transition to the adult coloration occurs at a C.L. of 4.0 to 7.0 mm; the venter of the abdomen has a somewhat triangular black field almost reaching the spinnerets; the anterolateral portion of the abdomen, and the dorsal surface, becomes dark-brown and then black; the patellae become dark-brown and then black, the femora remain yellow-buff. Juveniles of *Lycosa bicolor* at this size lack the pronounced dark red-brown markings on the dorsal surface of the abdomen, and when the patellae become dark brown, the distal halves of the femora are also very dark brown. Juveniles of both species may be found in adjacent burrows.

Adults show individual variation in the extent of the post-lateral yellow region of the abdomen; in some specimens this may continue forward and almost join anteriorly, in others this band may occupy most of the lateral surface, or be reduced to a narrow stripe. Adults normally have a narrow grey lanceolate stripe on the anterior dorsal surface of the abdomen, in some specimens this stripe may be absent in life but become conspicuous after preservation in alcohol.

Eye measurements were recorded for 10 specimens; each measurement is given below in Table 5 as a per-cent of the total width of the first eye row.

TABLE 5
EYE DIAMETERS AND INTERSPACES OF
L. storri CONVERTED TO PERCENT OF
THE TOTAL WIDTH OF THE FIRST ROW OF EYES

Regd No.	Sex	C.L.	AM	AL	PM	PL	AM:AM	AM:AL	PM:PM	AM:PM
Holotype	♀M	9.6	21	16	53	47	11	9	33	9
WAM 70-22	♀P	9.3	23	14	57	46	10	10	34	8
WAM 70-245	♀M	11.4	23	16	57	48	9	8	30	9
WAM 71-174	♀M	9.6	23	15	56	48	10	8	31	8
WAM 71-175	♀M	11.0	23	15	53	48	11	9	30	9
WAM 71-176	♀P	9.2	22	15	53	47	11	11	34	9
WAM 69-888	♀M	9.8	22	15	52	48	10	10	33	9
WAM 69-886	♀P	9.0	22	15	56	46	10	9	34	10
WAM 69-890	♀M	9.2	21	16	57	48	8	8	31	8
WAM 70-202	J	6.9	21	17	53	47	11	7	29	9

The measurements of the leg segments of 3 specimens are given in Table 4. Some variation in relative proportions can be observed.

The epigynum and internal genitalia of the holotype is illustrated in Figure 3a, e, with the internal genitalia of 3 additional females (WAM 70-245, WAM 69-962, WAM 69-888) illustrated in Figure 3b, c, d.

SIZE RANGE: Mature females C.L. 9.0 to 11.4 mm.

DIAGNOSIS: *Lycosa storri* belongs to the 'bicolor group' of species, but is readily identified by the yellow-buff femora, and the yellow or buff post-lateral area on the abdomen.

LIFE HISTORY

Mature females are to be collected from early November to February. Females carrying egg cocoons or young have not been observed, and it is not known when copulation takes place, as mature males are rare. During February the young are common in very small open burrows; by June the juveniles are in the transition stage to adult coloration. This species is commonly in association with *Lycosa bicolor*, a species with a very similar burrow, epigynum, and behaviour. The coloration of the legs is quite different however.

HABITAT

Red clay or red-brown desert loam soils with Mulga or Eucalyptus woodland. Some specimens have been reported from light sandy-loams of a yellow-brown colour (HB), on hard clay soil with a York Gum—Salmon Gum association (BYM), limestone desert soils with Mallee (BYM), or on red-pink soil at the bottom of a slope with *Acacia acuminata* and tussock grass (BYM).

BURROW

Open vertical type without a rim or mound, usually in open areas free of vegetation. The upper portion of the burrow is normally silk-lined and may on occasions be sealed with a thin webbed veil. The burrow has a maximum diameter of 16 mm and descends to a depth of between 13 and 20 cm. Some specimens have an enlarged terminal chamber up to twice the diameter of the burrow in width, and extending some 5 cm vertically. One specimen from Billeranga (WAM 68-501) was reported to have a pebble door (BYM). Juveniles may have a slight rim or mound at the entrance of the burrow whilst others have the burrow entrance flush with the surface. Under laboratory conditions females construct an open vertical burrow with a large chamber below.

Adults and juveniles drape the cephalothorax over the rim of the burrow, with the three anterior legs spread apart, and wait for prey to approach within range; the fourth pair of legs extend down the burrow with the posterior half of the abdomen. The spider rapidly withdraws itself down the burrow when disturbed. This species has not been observed to wander away from the burrow entrance.

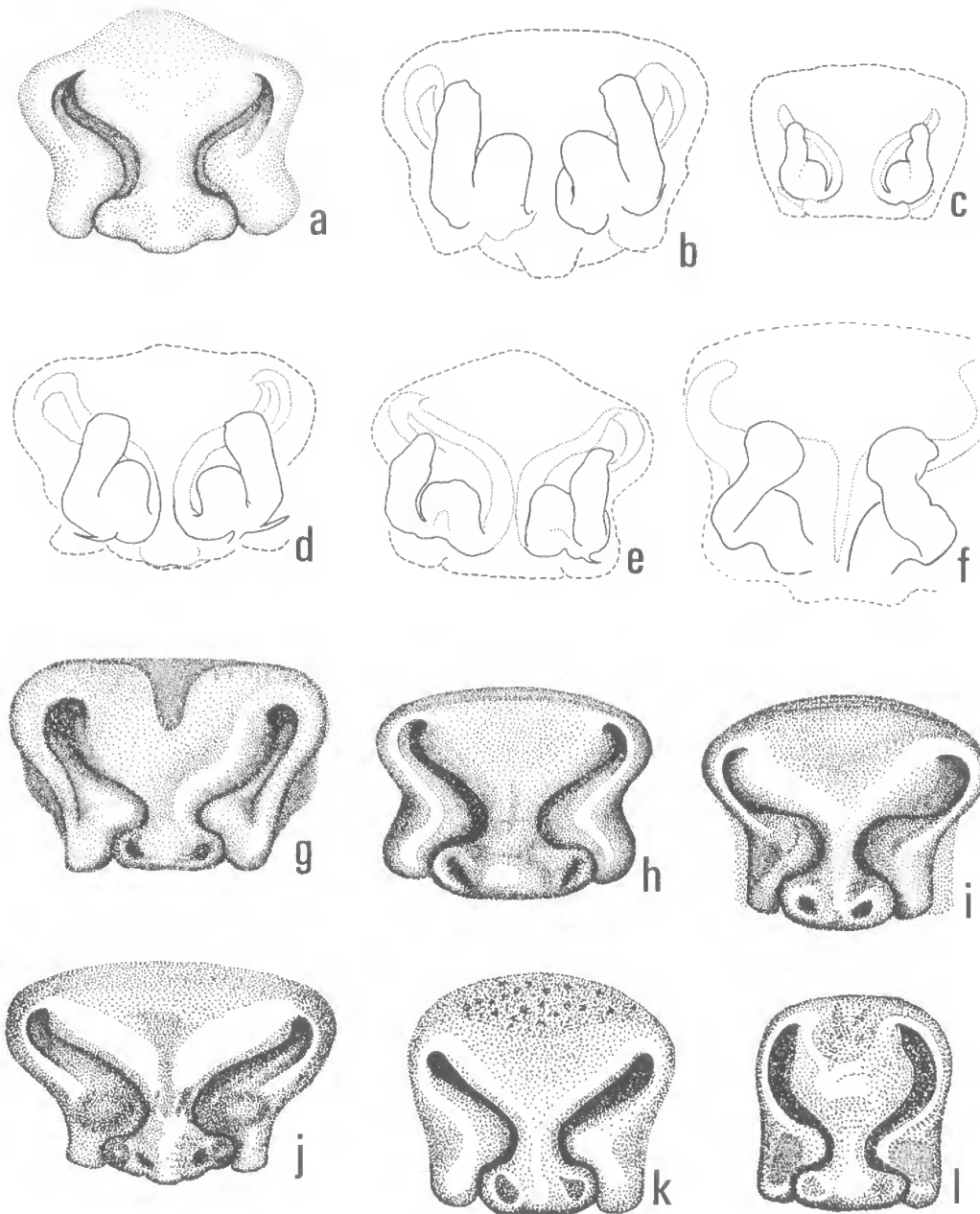


FIG. 3: a-e, *Lycosa storri*, female genitalia; a, epigynum of holotype; b-e, internal genitalia of WAM 70-245, WAM 69-962, WAM 69-888, and holotype.
 f-h, *Lycosa perinflata*, female genitalia; f, internal genitalia of WAM 71-643, g, epigynum of holotype; h, epigynum of female from Woolshed Flats, S.A.
 i, *Lycosa errans*, epigynum of holotype.
 j, *Lycosa castanea*, epigynum of holotype.
 k-l, *Lycosa skeeti*; k, epigynum of holotype; l, epigynum of female from Coopers Creek.

DISTRIBUTION

Arid and semi-arid regions of Western Australia.

DERIVATION

Named after Dr Glenn Storr of the Western Australian Museum in recognition of his taxonomic studies on Western Australian reptiles, and the encouragement he has given to taxonomists and naturalists.

***Lycosa errans* Hogg, 1905**

(Fig. 3i)

Lycosa errans Hogg, 1905, pp. 579–80, fig. 84, no locality given; Rainbow, 1911, p. 267; Bonnet, 1957, p. 2640.

Hoggicosa errans: Roewer, 1954, p. 247.

MATERIAL EXAMINED

HOLOTYPE: SAM, ♀ M, C. L. 12.6 mm, legs complete, labelled '*Lycosa errans*. H. R. Hogg. Type. No locality. F 170' in pencil, and on the reverse, 'S.A. Mus. Coll.'. One label '*Lycosa errans* Hogg. No locality' in indian ink, and 'Type' printed in orange. The holotype is in good condition, contrary to what Pulleine (1922, p. 83) states.

DESCRIPTION (After Hogg, 1905)

Female. Cephalothorax red-brown with yellow-brown hair; mandibles black-brown, with rather brighter coloured hair; labium, maxillae, sternum, and coxae dark chocolate-brown.

Abdomen dark brown above with four pale spots at the base, and transverse stripes of bright pale buff from middle to posterior end. Undersurface with a broad dark brown field reaching from base nearly to the spinnerets; sides light yellow-brown. Legs yellowish-brown, patellae and tibiae darkest, undersurface of the femora almost silver-grey.

Anterior row of eyes straight, the AL a radius from the AM which are $1\frac{1}{2}$ times that distance apart, their diameter being rather more than twice the same. AM a radius from the PM whose diameter is twice that of the AM and this is $1\frac{1}{2}$ times their distance apart.

Epigynum trapezoidal in outline, broadest anteriorly, where it is broader than its length.

Legs long and stout; no spines above on tibiae I and II; two each on tibiae III and IV.

DISCUSSION

Hogg (1905, p. 571) separates *Lycosa errans* from *Lycosa castanea* in his key to the species, and gives additional remarks under the discussion of *Lycosa castanea*. Unlike Hogg, I find two spines above on the tibiae of leg 2 in *L. errans*, and I find that the clypeus is about $\frac{3}{4}$ of the diameter of an AM in both holotypes (*L. errans* has clypeus 9–10 units, AM 14; *L. castanea* has clypeus 10, AM 14); the brown field on the venter of the holotype of *L. castanea* is slightly narrower than in *L. errans*. The ratio of the eyes of *L. errans* (holotype) AM:AL:PM:PL = 14:10:29:22; distance AM:AM 5, AM:AL 2.5, AM:PM 5, AL:PM 4, PM:PM 20. Width of anterior row of eyes 59.

The epigynum of the holotype has been poorly figured by Hogg (1905, fig. 84b) and is refigured here (Fig. 3i). Additional material may show that *Lycosa errans* and *Lycosa castanea* are synonyms. *Lycosa perinflata* is almost certainly a junior synonym of *Lycosa errans* but until more material becomes available I prefer to treat *L. perinflata* as a separate species.

DISTRIBUTION

South Australia.

Lycosa perinflata Pulleine, 1922

(Figs. 3f-h)

Lycosa perinflata Pulleine, 1922, p. 84, pl. 5, Whyte-Yarcowie, South Australia; Roewer, 1954, p. 272; Bonnet, 1957, p. 2657.

MATERIAL EXAMINED

HOLOTYPE: SAM, ♀ M, C. L. 11.9 mm, with all legs (except first on the left side, the femora and patellae of the fourth legs, and the left side palp) detached and loose within the tube. The skin has commenced to lift from the abdomen. Dark radiating lines are now visible on the carapace, and the colour pattern still persists on the abdomen.

OTHER MATERIAL: Woolshed Flats, S.A., iii.1908, R. H. Pulleine, ♀ M, C. L. 12.5 mm, SAM; Parachilna, S.A., 7 miles north, 22.viii.1970, HB, W. D. L. Ride, ♀ M, C. L. 13.4 mm, WAM 71-643.

DESCRIPTION (After Pulleine, 1922)

Female. Cephalothorax reddish-brown with fine white hair; median brown lines extending on to eye area in front, uniting behind and then spreading into a broad fork with radiating brown lines and spots on either side, running into a brown splashed area on the margins of the thorax; mandibles dark shining brown with thick white hair interspersed with dark brown hairs; labium and maxillae reddish brown; sternum and coxae darker brown with fine black hair.

Abdomen dirty white above with four discrete broad greyish-black bands interspersed with small spots, and a similar densely-spotted area on sides. Undersurface yellow-white with a broad longitudinal black band narrowing towards the black spinnerets.

Legs dark brown, undersurface of tibiae white in marked contrast to the remaining segments.

VARIATION: The eye measurements of the holotype are AM:AL:PM:PL = 13:9:29:22; distance AM:AM 5, AM:AL 2, AM:PM 5, AL:PM 3, PM:PM 16. Width of anterior row of eyes 53. The ♀ M from Woolshed Flats has AM:AL:PM:PL = 15:10:31:25; distance AM:AM 7, AM:AL 4, AM:PM 6, AL:PM 4, PM:PM 21. Ocular quadrangle 74 × 79. Clypeus to AM 11. Width of anterior row of eyes 62. WAM 71-643 has AM:AL:PM:PL = 18:13:43:35; distance AM:AM 9, AM:AL 4, AM:PM 8, AL:PM 8, PM:PM 25. Width of anterior row of eyes 78.

The chelicerae with three equal sized retromarginal teeth on each side; the left retromarginal teeth of the holotype have the inner two fused together at the base.

The epigyna of the holotype (Fig. 3g) and the female from Woolshed Flats (Fig. 3h) are illustrated. The internal genitalia of WAM 71-643 is shown in Figure 3f.

SIZE RANGE: Mature females C.L. 11.9 to 13.4.

DISCUSSION

A comparison of the holotypes of *Lycosa perinflata* and *Lycosa errans* leaves little doubt that *L. perinflata* is a junior synonym of *L. errans*. The illustration of the holotype of *L. errans* (Hogg, 1905, fig. 84a) is poor. WAM 71-643 has the colour pattern illustrated in Pulleine (1922, pl. 5).

BURROW

McKeown and Mincham (1948, pp. 214-5, 218) recorded this species from Willalo, S.A., and in this area counted fifty holes within a radius of two chains from a telephone pole. Apparently the burrows are open, vertical, and do not possess a lid or door.

DISTRIBUTION

South Australia.

Lycosa castanea Hogg, 1905

(Fig. 3j)

Lycosa castanea Hogg, 1905, pp. 577-9, fig. 83, Adelaide, South Australia; Rainbow, 1911, p. 266; Bonnet, 1957, p. 2637.

Allocosa castanea: Roewer, 1954, p. 206.

MATERIAL EXAMINED

HOLOTYPE: SAM, ♀ M, C.L. 12.0 mm, labelled '*Lycosa castanea* H.R.H. S.A. Mus. No locality Type' in pencil, and '*Lycosa Castanea* Hogg. No Locality. S.A. Museum' on another label; included in the tube is a small label 'fig. 190' in pencil. Four legs are detached and loose within the tube; one leg has only the femur attached. The epigynum (Fig. 3j) is very similar to that of *Lycosa errans*.

DESCRIPTION (After Hogg, 1905)

Female. Cephalothorax and mandibles pale yellow-brown, with pale yellowish-grey hair; no distinct pattern; labium, maxillae, and coxae bright yellow-brown. Abdomen bright chestnut brown above with pale creamy-yellow transverse stripes. Undersurface with a chestnut triangular field, broadest at the base and narrowing to the spinnerets, which lie at its apex; sides pale creamy-yellow.

Anterior row of eyes straight, AM being $1\frac{1}{2}$ times as far apart as they are from the AL; their diameters are in the same proportion. AM a radius from the PM which are slightly less than their diameter apart and twice that of the AM. Clypeus as broad as the AM.

Epigynum of a trapezoidal outline, broader than long, with the broadest part anteriorly, where the middle ridge is also very broad, tapering to where it springs from a base of the usual type.

Legs long and powerful; one spine above on tibia I, two on tibiae II, III, and IV.

DISCUSSION

See discussion under *Lycosa errans*. Known only from the holotype.

DISTRIBUTION

South Australia.

Lycosa skeeti Pulleine, 1922

(Figs. 3k-1)

Lycosa skeeti Pulleine, 1922, pp. 83-4, pl. 5, Wilson, Flinders Range, South Australia; Roewer, 1954, p. 272; Bonnet, 1957, p. 2664.

MATERIAL EXAMINED

HOLOTYPE: SAM, ♀ M, C.L. about 13.7 mm, carapace badly broken on the thoracic part; abdomen shrunken; legs mostly broken off, but retained in tube; coloration as illustrated by Pulleine (1922, pl. 5). Two labels, '*Lycosa skeeti* Pulleine, Flinders Ranges, S.A., R.H.P. Coll. Wilson 4. 1908' in ink, and 'Wilson Sp. Ap. 08' in blue-green pencil. The epigynum is intact, and is now illustrated (Fig. 3k). I have labelled this specimen holotype.

OTHER MATERIAL: One ♀ M, C.L. 12.5 mm, SAM no date but labelled 'Pull. coll.' legs removed on one side and abdomen damaged; Coopers Creek, Pulleine coll., no date; ♀ P, C.L. 10.9 mm, SAM, ♀ M, C.L. 12.7 mm, SAM, epigynum well developed (Fig. 3l), both specimens are a little damaged but still have a pronounced and rather striking pattern on the dorsal surface of the abdomen; the ♀ P has a broad brown field almost covering the venter of the abdomen, reaching almost to the base of the spinnerets, the ♀ M has a narrower brown bar tapering slightly, and not reaching the base of the spinnerets.

DESCRIPTION (After Pulleine, 1922)

Female. Cephalothorax light brown, clothed with silvery-grey hair; darker brown median streak with four similar streaks on each side; mandibles with long silvery hair; labium, maxillae and sternum dark brown.

Abdomen light brown above, darker brownish-black below, with spinnerets a lighter shade: the dorsal surface of the abdomen has, on the posterior part, two nearly straight black parallel lines meeting at their ends; anterior to this, three black parallel sinuate lines; in front, two lateral black forked lines, not meeting medially.

Legs and palpi the same colour as the thorax and clothed with fine silvery hairs interspersed with strong black spines.

Epigynum small of simple form, i.e. two depressions with a median ridge.

DISCUSSION

Lycosa skeeti appears to be a valid species with a distinctive colour pattern. It is similar in many respects to *Lycosa bicolor* and may prove to be a subspecies of the latter.

Pulleine (1922, pl. 5) shows the femora to be much darker than the remaining leg segments although this is not mentioned in the description; the holotype has the femora dark brown. Additional specimens are required.

DISTRIBUTION

South Australia.

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